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Six New North American Species of *Melanagromyza* Hendel (Diptera, Agromyzidae)

George C. Steyskal

Cooperating Scientist, Systematic Entomology Laboratory, IIBII, Agric. Res., Sci. and Educ. Admin., U.S.D.A., c/o U.S. National Museum of Natural History, Washington, D. C. 20560

ABSTRACT

The following new species are described: *Melanagromyza hicksi* (Ontario; host, *Alcea rosea* L., Malvaceae), *M. lomatii* (Oregon; host, *Lomatium nudicaule* [Pursh] C. & R., Apiaceae), *M. panacis* (Indiana; host, *Panax quinquefolius* L., Araliaceae), *M. radicolica* (Maryland; host, presumably *Urtica dioica* L., Urticaceae), *M. vernoniae* (Maryland; host, *Vernonia noveboracensis* [L.] Michx.), and *M. vernoniana* (Maryland; host, *V. noveboracensis* [L.] Michx.). The latter two species were reared from the same plant in the same locality. Male postabdominal characters of *M. angelicae* (Frost) are figured for the first time for comparison with those of *M. hicksi*.

The descriptions here presented are part of the author's cooperation with Kenneth A. Spencer in the preparation of a manual of the Agromyzidae of the United States, and the species are described here in order to provide more complete description than would be proper to the Manual.

As with most species of *Melanagromyza*, the most distinctive characters are found in the male postabdomen (terminalia). Relationships will be brought out in the keys to be presented in the Manual, although the closest apparent relatives of each species are cited here. All species described herein belong to the major group of North American *Melanagromyza*, with wing vein C extending to M_{1+2} and with only 2 pairs of dorsocentral bristles, both postsutural.

Melanagromyza hicksi Steyskal, new species

(Figs. 1-3)

? "*Anthomyza*" *angelicae* Frost, Hansberry, 1940: 199.
Melanagromyza sp. (Steyskal), Spencer, 1969: 78.

Male. Length of wing 3.0 to 3.2 mm.

Head as in Fig. 2; front matt black, at level of hindmost fronto-orbital bristle 0.43 to 0.46 of total head width (= head 2.12 to 2.22 times as wide as front); frontal orbits rather dull, sloping upward from eye margin, somewhat broadened anteriorly, with 4 or 5 lower inclinate bristles and numerous, rather irregularly disposed setulae, the lowermost proclinate; gena 0.18 of eye-height; antennae narrowly separated by low median keel; arista finely pubescent, 0.57 mm long; eye with sparse, short hairs in upper part.

Mesonotum metallic dark bluish black, shining laterally, dull mesally with minute, rather dense rugosity; dorsocentral bristles 2, strong, anterior one slightly posterad of level of supra-alar bristle; acrostichal setulae in approximately 8 rows, a few extending posteriorly to scutellar suture.

Wing as in Fig. 3; last section of vein M_{3+4} 0.8 length of penultimate section; squamae and fringes whitish; halter with knob wholly black.

Foretibia without median bristle; midtibia with 2 median bristles, each shorter than tibial diameter.

Abdomen metallic greenish black; postabdomen as in Fig. 1; aedeagus with rounded subbasal swelling on anterior side, gap between U-shaped basiphallus and distiphallal complex about 0.6 length of latter; epanthrium (Fig. 1D) in profile with ventral margin moderately but sharply offset at about 0.4 of distance from anterior margin.

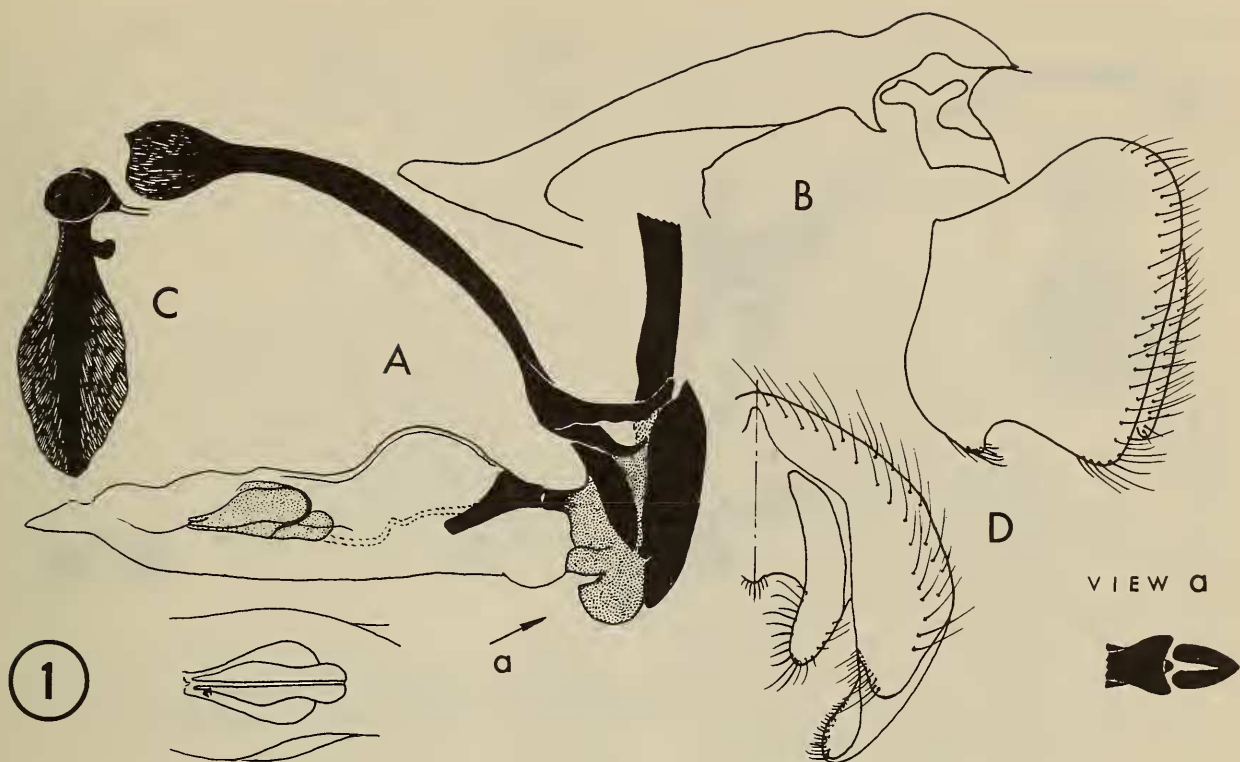


Fig. 1. *Melanagromyza hicksi* Steyskal. A, hypandrium and aedeagus, with ventral view of distiphallie complex; B, hypandrium, ventral view; C, sperm pump; D, epaandrium, posterior (half) and profile view.

Female. Similar to male; front 0.42 to 0.44 of total head width; length of wing 3.1 to 3.4 mm; abdomen shining dark metallic bluish green; ovipositor sheath equal in length to last dorsal preabdominal tergum.

Types.—Holotype (♂), allotype, and 5 ♂ and 3 ♀ paratypes, Windsor, Ontario, Canada, 5 May 1946 (Stanton D. Hicks), reared from puparia found in pith near base of hollyhock (*Alcea rosea* L.; Malvaceae); in U.S. National Museum of Natural History.

Remarks.—This species is most closely related to a species to be described in the Manual by Spencer, but it is also related to another species described at this time, *M. panacis*. It is most decisively distinguished from its relatives by details of the male post-abdomen. It is likely that *M. hicksi* is the species whose damage to hollyhock was noted by Hansberry (1940) at Ithaca, New York, as *Anthomyza* (sic) *angelicae* Frost. The postabdomen of a toptotypical para-

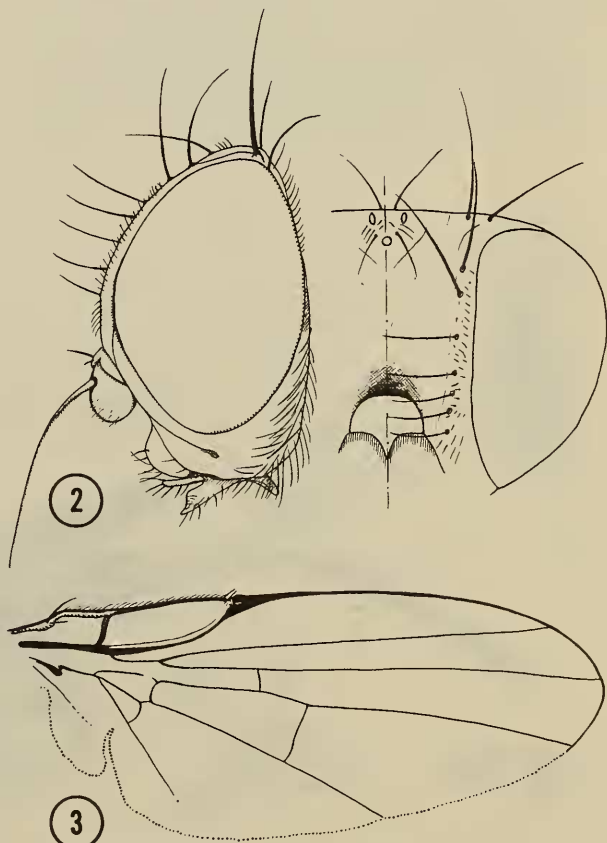


Fig. 2. *Melanagromyza hicksi* Stryskal. Head in profile and anterior views. Fig. 3. *Melanagromyza hicksi* Steyskal. Right wing.

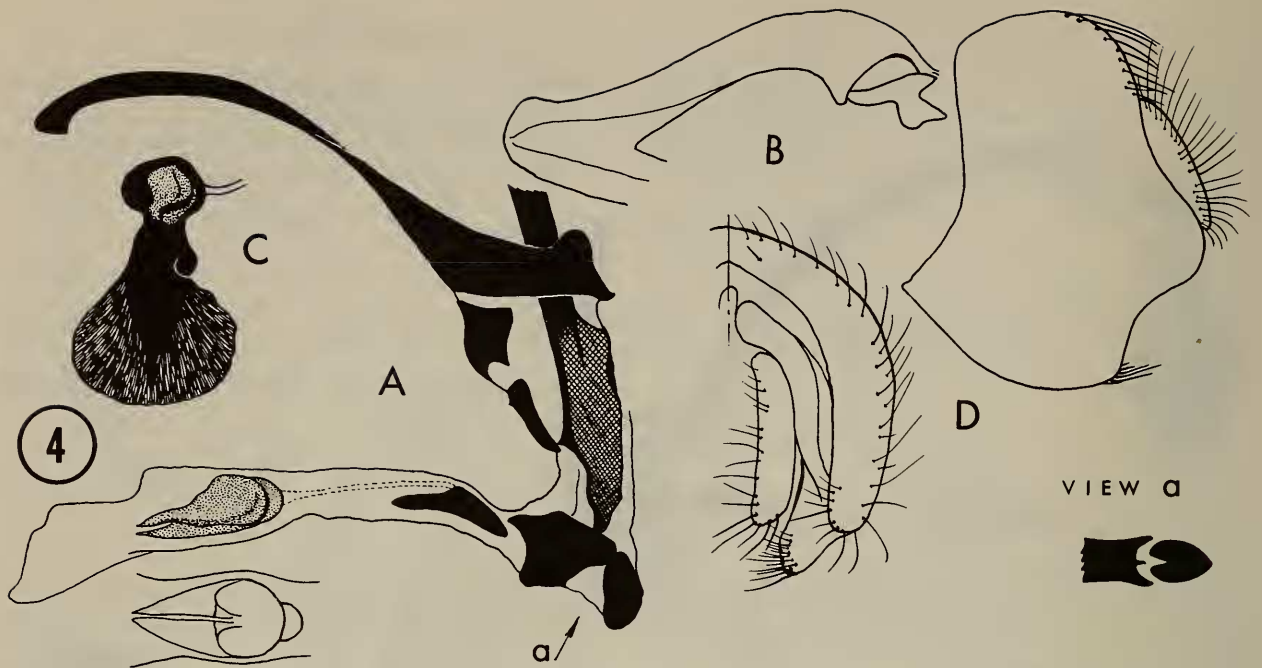


Fig. 4. *Melanagromyza angelicae* (Frost). A, aedeagus in profile, with details at right angle view; B, hypandrium, ventral view; C, sperm pump; D, posterior half (left) and profile (right) of epandrium.

type of *Melanagromyza angelicae* (Frost), originally described in *Agromyza*, and from Ithaca (S. A. Mills) as shown in detail in Fig. 4, wherein many differences from corresponding features of Fig. 1 may be seen.

I am pleased to name the species for my longtime friend Stanton D. Hicks, with apologies for taking so long to describe it.

Melanagromyza lomatii Steyskal, new species

(Fig. 5)

Male. Wing length 2.5 to 3.0 mm. Entire body and appendages black, mesonotum and abdomen with only slight bluish green metallic sheen.

Head with front at level of anterior *ors* 1.75 times as wide as an eye (0.47 of total width of head), cheek nearly half as high as eye; anterior front projecting

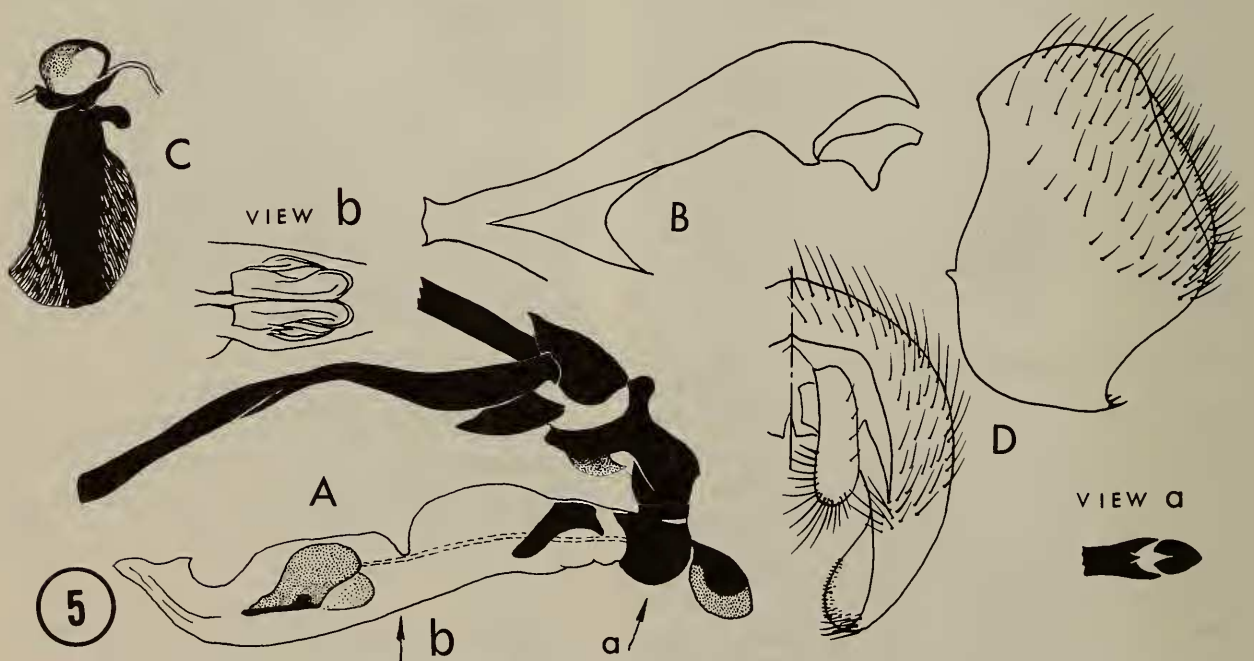


Fig. 5. *Melanagromyza lomatii* Steyskal. A, hypandrium and aedeagus, lateral view, with ventral view (b) of distiphallal complex; B, hypandrium, ventral view; C, sperm pump; D, epandrium, posterior (half) and profile views.

well before eye; parafrontal stripes dull, bearing 2 *ors*, 4 or 5 strong *ori*, and 2 rows of numerous setulae, mesal row proclinate; ocellar triangle lightly tomentose, subshining, apex about 60°; lunule semicircular, flat, grayish tomentose; facial carina broad, moderately raised, a little bent forward medially in profile; eye conspicuously hirsute above; antennae small, 3rd segment roundish, arista 0.45 mm long, apparently bare.

Mesonotum subshining, with about 8 rows of acrostichal setulae, several of which extend nearly to scutellar sulcus, and with 2 pairs of strong dc bristles, anterior pair at level of supra-alar bristles.

Wing very similar to that of *M. hicksi* (Fig. 3), 2.35 times as long as wide, distance between crossveins *ta* and *tp* about 1.25 times length of *tp*; squamae hyaline, marginal cord and fringe blackish; halter black.

Midtibia with 2 distinct medial bristles nearly as long as tibial diameter; foretibia without medial bristle.

Abdomen subshining; postabdomen as in Fig. 5, aedeagus with deep sulcus on anterior side between tumid basal half and apical half; basiphallic sclerite U-shaped, gap between it and distiphallic complex equal in length to latter; epandrium (Fig. 5D) in profile with midventral prong preceded by strongly arcuate free anterior margin and followed by sinuately sloping ventral margin.

Female. Similar to male; eye bare; length of wing 2.7 to 3.2 mm; abdomen with ovipositor sheath dorsally about as long as last preabdominal sclerite.

Types.—Holotype (♂), allotype, and 8 ♂ and 6 ♀ paratypes, La Grande, Union County, Oregon, 7 to 29 April 1964 (holotype, 22 April), reared from stems of biscuit root, *Lomatium nudicaule* (Pursh)

C. & R. (Jon Skovlin); in U.S. National Museum of Natural History.

Remarks.—The fly is closely related to a Californian species being described elsewhere by Spencer; the host of that species is not known.

The name *lomatii* is the genitive case of the generic name of its host, *Lomatium nudicaule* (Pursh) C. & R., of the family Apiaceae or Umbelliferae. The habit of *M. lomatii* of boring in the upper half of the stem of its host plant was described in an unpublished report on file in the Portland, Oregon office of the Forest Insect and Watershed Management Research, Pacific Northwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture.

Melanagromyza panacis Steyskal, new species

(Fig. 6)

Male. Length of wing 2.4 to 2.8 mm.

Head with front matt black, at narrowest point 0.39 of total width of head; frontal orbit rather dull, parallel-sided, 0.08 mm wide, with hairs and conformation similar to that of *M. hicksi* (Fig. 1), but more of lower mesal hairs proclinate and with 3 or 4 inclinate bristles; ocellar triangle with minute, sparse tomentum; antennae narrowly separated by low median keel; arista finely pubescent (preserved, but in contorted condition, only in Wooster paratype); upper part of eye with long, rather numerous hairs.

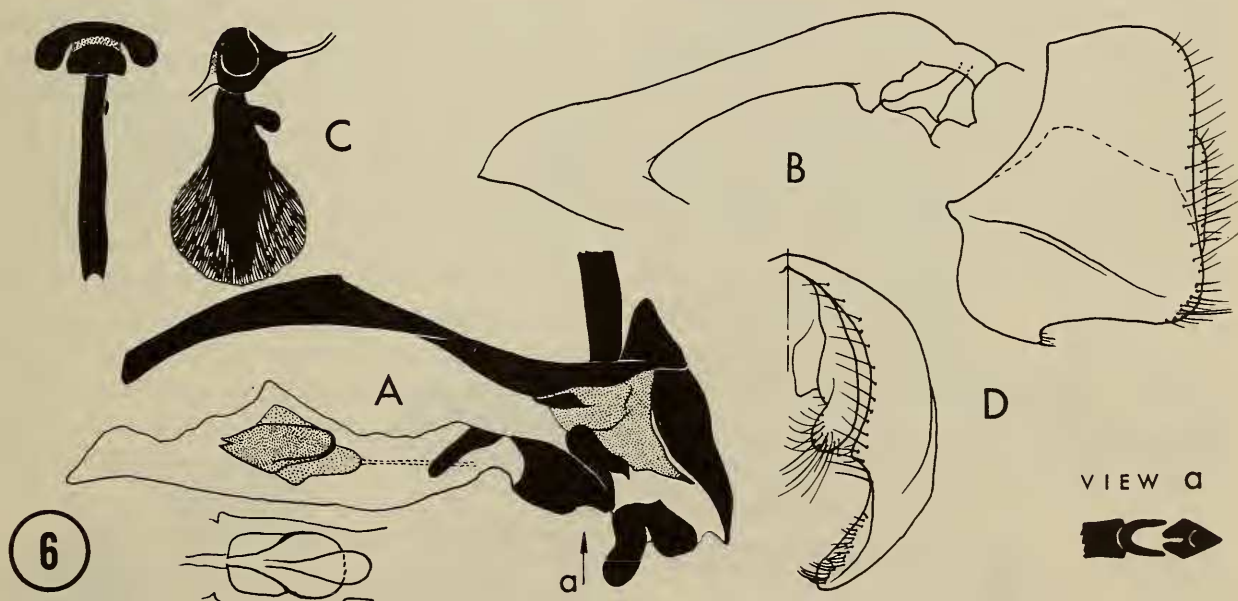


Fig. 6. *Melanagromyza panacis* Steyskal. A, hypandrium and aedeagus, lateral view, with ventral view of distiphallic complex; B, hypandrium, ventral view; C, sperm pump, profile and efferent views; D, epandrium, posterior (half) and profile views.

Mesonotum virtually black, with only slight metallic greenish tinge; subshining, with minute, rather sparse rugulosity; 2 strong dorsocentral bristles, anterior of which slightly posterad of supra-alar bristle; acrostichal hairs in about 8 rows, a few extending almost to scutellar sulcus.

Wing similar to that of *M. hicksi* (Fig. 3), but only 2.0 to 2.15 times as long as wide; squamae and fringes whitish; knob of halter wholly blackish.

Fore tibia with median bristles; midtibia with 2 such, each somewhat shorter than tibial diameter.

Abdomen shining, dark metallic greenish black; postabdomen as in Fig. 6; aedeagus with small anterior swelling near base, gap between U-shaped basiphallus and distiphallus complex 0.7 length of latter; epandrium (Fig. 6D) in profile with ventral margin sharply but very little offset.

Female. Similar to male; length of wing 2.7 to 2.9 mm; abdomen shining dark metallic green; ovipositor sheath as long as last dorsal preabdominal sclerite.

Types.—Holotype, allotype, and 1 ♂ and 3 ♀ paratypes, Washington Co., Indiana, April, 1966, boring in American ginseng (*Panax quinquefolius* L.; Araliaceae); 1 ♂ paratype, Wooster, Wayne County, Ohio, 3 April 1933, in stem of ginseng (Houser); in (U.S.) National Museum of Natural History.

Remarks.—*M. panacis* is very similar to *M. inornata* Spencer, differing in smaller size and green abdomen; it also resembles *M. angelicae* (Fig. 4) and *M. hicksi* (Fig. 1),

the male terminalia showing distinct differences. The male terminalia of *M. inornata* was figured by Steyskal (1972: 3).

Melanagromyza radicolica Steyskal, new species

(Fig. 7)

Male. Length of wing 1.85 mm.

Head with front matt black, at narrowest point 0.37 of total width of head, at level of uppermost fronto-orbital bristles 1.35 times width of one eye; frontal orbit (Fig. 7D) dull, a little raised above eye, slightly wider at level of upper infraorbital seta (0.035 mm), and but little narrower posterad therefrom, but rapidly narrowing forward to little more than half its width in the upper part; frontal orbit with 3 upper bristles (1 ifo and 2 sfo) equally spaced and 1 ifo nearly as far anterad of the other ifo as the latter is from the upper sfo, hairs short, scattered, erect or reclinate; ocellar triangle subshining, with sparse minute tomentum; gena 0.17 of eye height, deepest near middle; antennae separated by narrow flat strip not forming a keel; 3rd antennal segment (Fig. 7C) nearly round in profile, 0.12 mm broad, somewhat less in length; arista 0.39 mm long, appearing bare at 40× magnification, finely pubescent at 90×, evenly tapering from slightly enlarged base; most of eye with sparse, short hairs; ommatidia uniform in size; proboscis small, well retracted.

Mesonotum blackish with slight greenish tinge; 2 strong dorsocentral bristles, anterior of which slightly posterior to level of supra-alar bristle; acrostichal hairs in about 8 rows, a few extending as far back as to approach scutellar sulcus.

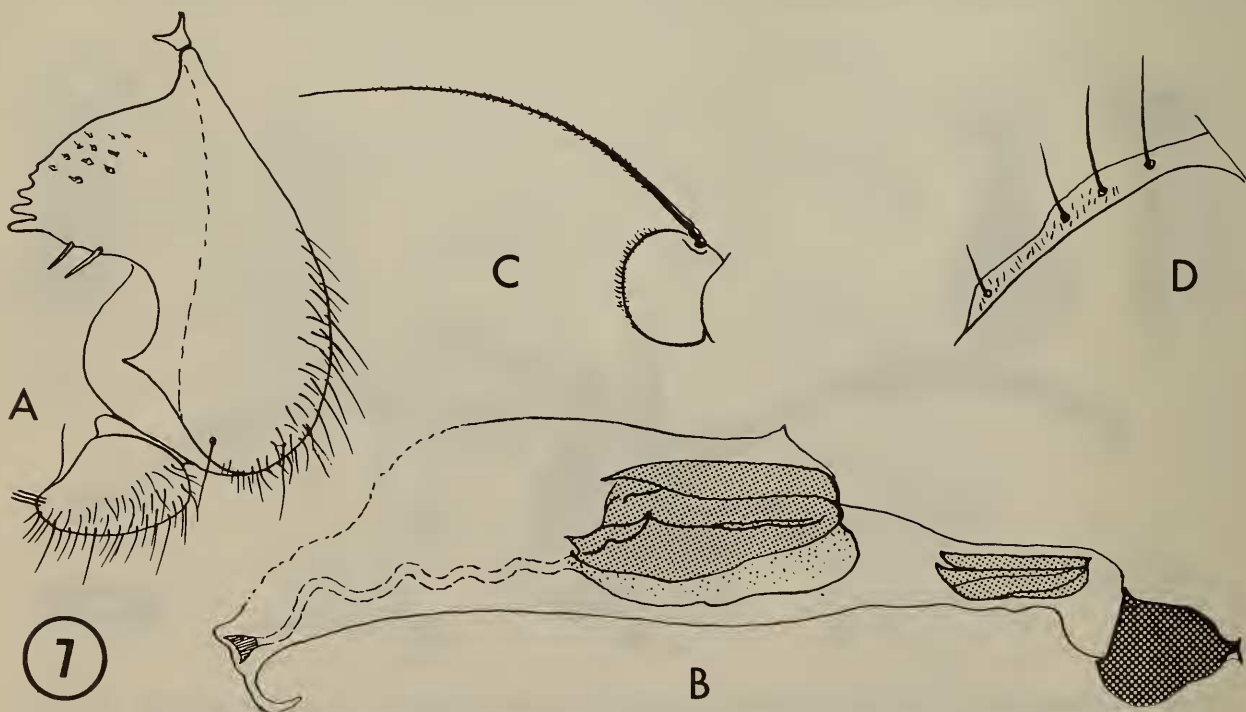


Fig. 7. *Melanagromyza radicolica* Steyskal. A, epandrium and cercus, sinistral-ventral view; B, aedeagus, lateral view; C, left antenna, profile; D, left frontal orbit, oblique dorsal view.

Wing $2.15\times$ as long as wide; last section of vein $M_{3+4} \frac{2}{3}$ as long as penultimate section; inner crossvein at 0.61 to 0.65 of length of discal cell (beyond middle); squamae pale yellowish, their fringe dark brown; knob of halter black.

Fore tibia without evident medial bristle; middle tibia with 1 posterior bristle almost as long as tibial diameter.

Abdomen shining, dark metallic greenish black; postabdomen as in Fig. 7; surstylus with lobe about as wide as long, bearing 2 thickened setae on posterior side and 3 digitate processes of decreasing length from rear forward as well as 2 small protrusions, all at apex, and several spicules on mesal surface; aedeagus (Fig. 7B) with long membranous apical extension ending in a hook; sperm duct within apical part of aedeagus ending in brownish infundibuliform orifice; cercus with apical group of 3 closely-spaced, equal-sized setae.

Female. Not known.

Types.—Holotype (δ), Bethesda, Montgomery County, Maryland, December, 1979, emerged indoors from root presumed to be of nettle, *Urtica dioica* L., collected a month previously. In U.S. National Museum of Natural History, with Spencer microslide no. 5089 attached to pin.

Remarks.—The closest relative of *M. radicicola* seems to be *M. minimoides* Spencer; however, the structure of the epandrial lobes or surstyli is quite characteristic and does not ally *M. radicicola* with any other North American species.

Two Species from *Vernonia noveboracensis*

In the course of the work by Donald M. Anderson (1970) on the simultaneous association of weevils of the genus *Smicronyx* (Curculionidae) with both dodder (*Cuscuta* spp.; Convolvulaceae) and its host ironweed (*Vernonia noveboracensis* [L.] Michx.; Asteraceae) 2 species of *Melanagromyza* were found that had bored in the stems of the *Vernonia* and had pupated in the lower end of their tunnels. The 2 species were twice found in the same host plant. They are very similar in general appearance but have a few distinctive characters, especially in the male postabdomen, that can only be specific.

Both species belong to a group of *Melanagromyza* distinguished by the following characters in addition to those common to all the species treated in this paper, viz., wing vein C attaining M_{1+2} and dorsocen-

tral bristles in only 2 pairs, both postsutural: Squamae and fringe whitish; proboscis ordinary, short; ocellar triangle not brilliantly polished; eye of male with small patch of pilosity near frontal orbit; mesonotum and abdomen black, at least partly greenish, bluish or aeneous metallic; foretibia without well-developed medial bristle; wing at least 2.22 but less than 3.00 mm long; frons distinctly but not strongly projecting above eye; lower fronto-orbital bristles (ifo) in 2 pairs, widely separated; basiphallus U-shaped, close to distiphallal complex.

This group includes the European species *M. aeneoventris* (Fallén) and 2 Californian species in process of description by Spencer.

Melanagromyza vernoniae Steyskal, new species

(Fig. 8)

Male. Length of wing 2.82 to 2.91 mm; width of head 1.04 to 1.10 mm.

Front at level of anterior ocellus 0.43 to 0.46 mm wide; gena deepest in middle, 0.21 of height of eye; genal setae of approximately equal length.

Terminalia as in Fig. 8; epandrium in profile strongly swollen anteriorly, with 3 transverse ridges; ventral tip of epandrium rounded and bearing a few short, stout posterior setae; distiphallal complex with short apical arms and compact basal structures; extension of phallapodeme large, basally broad; sperm pump with comparatively thick subbasal projection on apodeme.

Types.—Holotype (δ), Washington, D.C., emerged indoors 19 December 1968 from puparium collected 18 October 1968; 1 δ paratype, same locality, emerged indoors 20 February 1970; 2 male paratypes, same locality, emerged indoors 28 March 1970; all collected by D. M. Anderson from stem of *Vernonia noveboracensis* (L.) Michx. and deposited in U.S. National Museum of Natural History.

Remarks.—One female, Washington, D.C., emerged 28 March 1970, is considered as possibly the female of *M. vernoniae* on the basis of the depth of the gena, but it is not designated a paratype.

Melanagromyza vernoniana Steyskal, new species

(Figure 9)

Male. Length of wing 2.28 to 2.52 mm; width of head 0.93 to 0.96 mm.

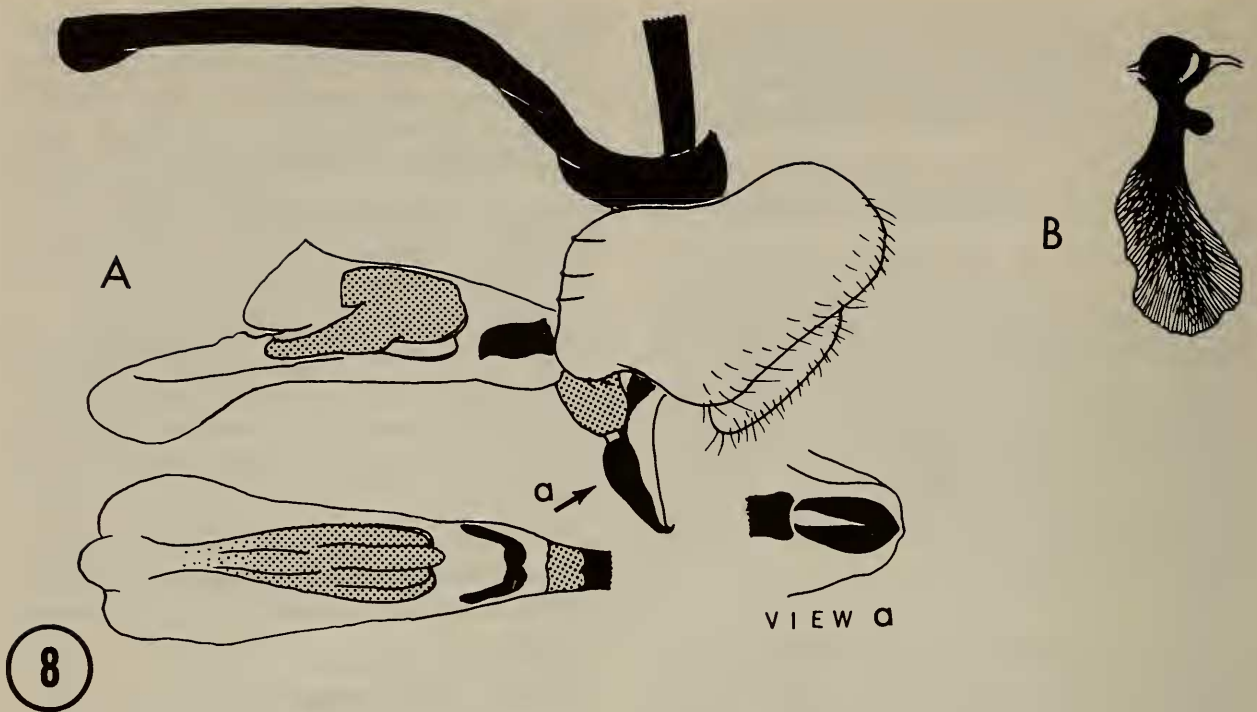


Fig. 8. *Melanagromyza vernoniae* Steyskal. A, postabdomen in profile, with ventral view of aedeagus and right angle view of phallopodeme; B, sperm pump.

Front at level of anterior ocellus 0.44 to 0.46 mm wide; gena deepest in middle, 0.14 of height of eye; genal setae with uppermost anterior seta (vibrissa) about twice as long as preceding setae.

Terminalia as in Fig. 9; epandrium in profile little swollen anteriorly, without ridges; ventral tip of

epandrium angulate, with a few short stout posterior setae; distiphallic complex with long, arcuate apical arms and flared basal structures; extension of phallopodeme small, with slender apex; sperm pump with comparatively slender subbasal projection on apodeme.

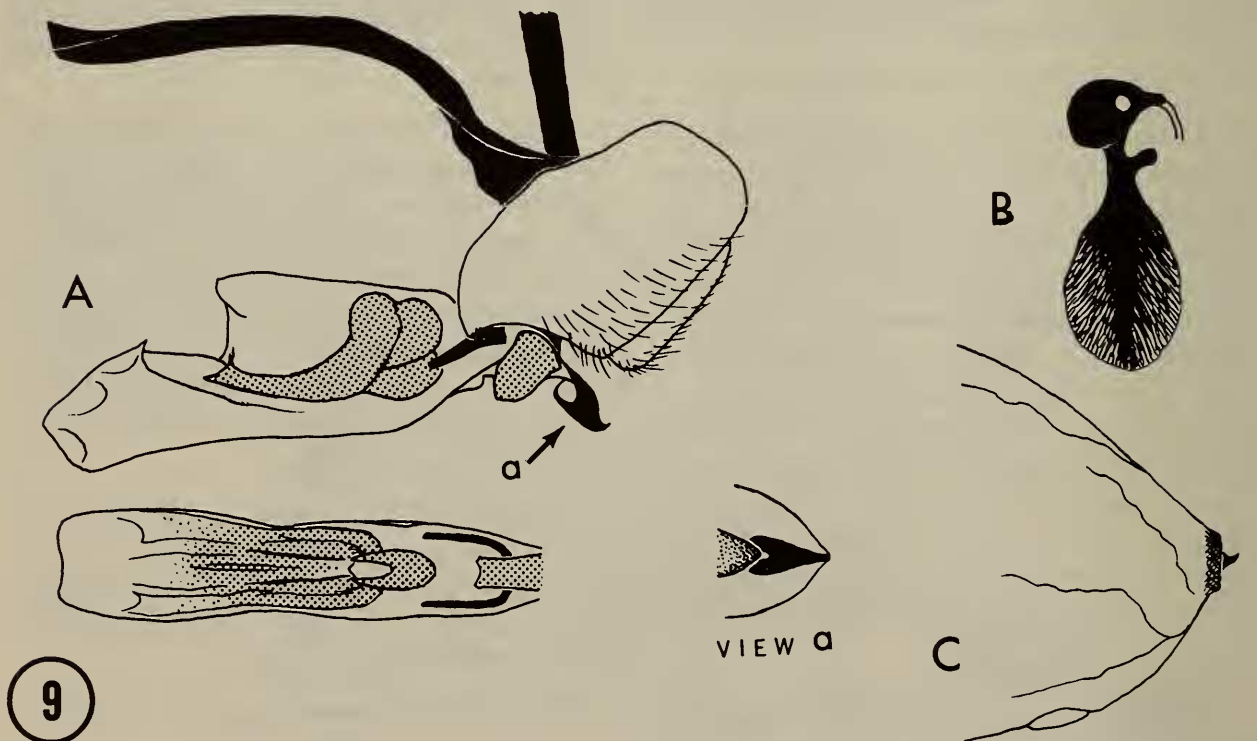


Fig. 9. *Melanagromyza vernoniana* Steyskal. A, postabdomen in profile, with ventral view of aedeagus and right angle view of phallopodeme; B, sperm pump; C, posterior end of putative puparium, profile view.

Types.—Holotype (♂), Cropley (on Potomac River 1.5 south of Great Falls), Montgomery County, Maryland, emerged indoors 11 February 1969 from puparium collected 20 October 1968; 1 ♂ paratype, Washington, D.C., emerged indoors 28 April 1970; both collected by D. M. Anderson from stem of *Vernonia noveboracensis* (L.) Michx. and deposited in U.S. National Museum of Natural History.

Remarks.—Five female specimens from the same locality and host as the male specimens are considered to be *M. vernoniana* because of the genal depth, but are not designated paratypes. A puparium is preserved

with one of these females; it is pale tawny, 3.8 mm long by 1.3 mm in diameter, and has the posterior end as in Fig. 9C. Each stigmatophore has a circle of 16 pores.

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